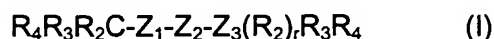


## In the Claims

1. (original) A flame retardant composition, which comprises

(a) a polymeric substrate, and

(b) at least one compound of formula (I)



wherein  $Z_1$  and  $Z_2$  are both  $NR_1$  and  $Z_3$  is C or N;  $r$  is 0, when  $Z_3$  is N, and  $r$  is 1, when  $Z_3$  is C;

the two  $R_1$ 's form together a bond or each  $R_1$  is independently H or forms a bond together with  $R_2$  present at the adjacent C-atom or, respectively,  $Z_3$ ;

each  $R_2$  independently forms a bond or is a monovalent radical as defined for  $R_3$  and  $R_4$  below;

each  $R_3$  is independently and each  $R_4$  is independently a monovalent radical selected from H, optionally substituted alkyl, optionally substituted alkyl interrupted with one or more O, N and/or S atom(s), optionally substituted cycloalkyl, optionally substituted cycloalkylalkyl, optionally substituted aryl, optionally substituted arylalkyl, optionally substituted alkoxy(alkyl)<sub>n</sub>, optionally substituted aryloxy(alkyl)<sub>n</sub>, optionally substituted arylalkyloxy(alkyl)<sub>n</sub>, optionally substituted alkenyl, optionally substituted alkenyloxy(alkyl)<sub>n</sub>, optionally substituted alkynyl, optionally substituted alkynyloxy(alkyl)<sub>n</sub>, optionally substituted heterocyclyl(O)<sub>s</sub>(alkyl)<sub>n</sub> with one to four heteroatoms selected independently from N, O and S;  $R-Y-C(O)-(alkyl)_n$  or  $R-C(O)-Y-(alkyl)_n$ , wherein each R independently is H, alkyl, alkenyl, cycloalkyl, aryl or heterocyclyl as defined above, each of which is optionally substituted, Y is O or NH;

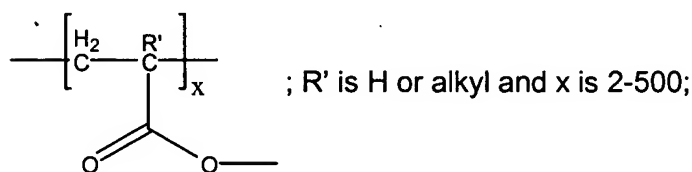
or at one or both of the C-atom and  $Z_3$ , as given in the above formula (I),  $R_3$  and  $R_4$  form together with said C-atom or, respectively  $Z_3$ , wherein they are attached to, an optionally substituted, saturated, partially saturated or aromatic, mono- or polycyclic ring system of 5 to 20 carbon and, optionally, hetero ring atoms, whereby the optional hetero ring atoms are selected from N, O and/or S; and  $R_2$  is a monovalent radical as defined for  $R_3$  and  $R_4$  above, or forms a bond between the C-atom and  $Z_1$  or,

respectively, between  $Z_3$  and  $Z_2$ , or forms a bond in the ring system formed by  $R_3$  and  $R_4$  between said C-atom or, respectively,  $Z_3$ , and a ring atom adjacent thereto;

each s and n is independently 0 or 1;

or  $Z_3$  forms together with  $R_2$ , if present,  $R_3$  and  $R_4$ , which are attached thereto, a group  $-R'_5([Z_1-Z_2-R_6]_k Z_1-Z_2-R_5-H)_t$ , wherein each  $R'_5$  and  $R_5$  is independently optionally substituted alkylene, optionally substituted alkylene interrupted with one or more N, O and/or S, optionally substituted cycloalkylene, optionally substituted cycloalkylenealkylene, optionally substituted cycloalkylenealkylenecycloalkylene, optionally substituted arylene, optionally substituted arylenealkylene, optionally substituted arylenealkylenearylene, optionally substituted heterocyclylene, optionally substituted heterocyclylenealkylene or optionally substituted heterocyclylenealkyleneheterocyclylene, each  $R_6$  independently has a meaning as given for  $R'_5$  and  $R_5$  above,  $Z_1$  and  $Z_2$  are each independently as defined above, t is 1-3 and k is chosen so that the molecular weight of the resulting compound of formula (I) is within 200 to 10000 g/mol; or  $Z_3$  together with  $R_2$ , if present,  $R_3$  and  $R_4$ , which are attached thereto, represent a linking group  $-R_8-$  to form  $R_2R_3R_4C-Z_1-Z_2-R_8-[U]_x$  which denotes a recurring structural unit of a polymer, wherein  $R_8$  is a linking bond or alkylene, cycloalkylene, heterocyclylene or arylene;

U is a  $\left[ \text{CH}_2 - \underset{\text{CR}^4}{\text{C}} \right]_x$ , or

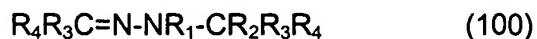


or the two  $R_3$ 's, as given in the above formula (I), form together with the  $-(R_2R_4)C-Z_1-Z_2-Z_3((R_2)_rR_4)-$  moiety an optionally substituted, saturated, partially saturated or aromatic, mono- or polycyclic ring system of 5 to 20 carbon and, optionally, further hetero ring atoms, whereby the further hetero ring atoms are selected from one or two of N, O and/or S; and wherein  $Z_1$  to  $Z_3$ , r and  $R_2$  to  $R_4$  are as defined above;

as well as an oxide of N as  $Z_1-Z_3$ , a salt, an ester or an amide thereof, or of a mixture of two or more compounds of formula (I) as defined above;

with the proviso that in the compound of formula (I) at least at one of the C-atom and  $Z_3$ , as depicted in the above formula (I),  $R_3$  and  $R_4$  are independently other than H and  $R_2$  is H or a bond;

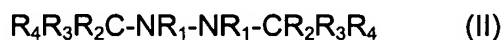
with the further proviso that when the compound of formula (I) is a compound of formula (100),



the polymeric substrate (a) is not an aromatic alkenyl homo or copolymer.

**2. (original)** A flame retardant composition according to claim 1, wherein the compound of formula (I) is selected from the following compounds of formulae (II)-(III):

a compound of formula (II)



wherein the two  $R_1$ 's form together a bond, or each  $R_1$  independently is H or forms a bond together with  $R_2$  present at the adjacent C-atom as defined in claim 1;

a compound of formula (III)



wherein the two  $R_1$ 's form together a bond;

wherein in the above formulae (II)-(III)  $R_1$  to  $R_4$  are defined in claim 1.

**3. (original)** A flame retardant composition according to claim 1, wherein in the compound of formula (I) both at the C-atom and at the  $Z_3$ -atom  $R_3$  and  $R_4$  are other than H and  $R_2$  is H or a bond.

**4. (original)** A flame retardant composition according to claim 1, wherein the compound (I) is acyclic and  $-Z_1-Z_2-$  is symmetrically substituted.

5. (original) A flame retardant composition according to claim 1, wherein the compound (I) is acyclic and  $-Z_1-Z_2-$  is unsymmetrically substituted.

6. (original) A flame retardant composition according to claim 1, wherein the compound of formula (I) is a compound of formula  $R_4R_3R_2C-N=N-CR_2R_3R_4$  (IIa).

7. (currently amended) A flame retardant composition according to claim 2, wherein the compound of formula (II) is acyclic and  $R_3$  and  $R_4$  at the same C-atom form together therewith an optionally substituted, saturated, partly saturated or aromatic, mono- or polycyclic ring system ~~as defined in claim 4~~, wherein said rings are ~~selected from~~ cycloalkyl or aryl which is unsubstituted or substituted with 1-3 of  $-OH$ ,  $-NH_2$ ,  $-COOH$ , alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, aryl, arylalkyl, alkyl-C(O)-O-, alkenyl-C(O)-O-, and/or alkyl-O-C(O)-, whereby cycloalkyl and/or aryl moiety as or in said substituents is optionally substituted with alkenyl.

8. (original) A flame retardant composition according to claim 1, wherein  $Z_3$  forms together with  $R_2$ ,  $R_3$  and  $R_4$ , which are attached thereto, a group  $-R'_5([Z_1-Z_2-R_6]_kZ_1-Z_2-R_5-H)_t$  as defined in claim 1, wherein each  $R'_5$  and  $R_5$  is independently optionally substituted alkylene, optionally substituted cycloalkylene, optionally substituted cycloalkylenealkylene, optionally substituted arylene, optionally substituted arylenealkylene, optionally substituted heterocyclylene, optionally substituted heterocyclylenealkylene, optionally substituted cycloalkylenealkylenecycloalkylene, optionally substituted arylenealkylenearylene or optionally substituted heterocyclylenealkyleneheterocyclylene; each  $R_6$  independently is optionally substituted alkylene, optionally substituted alkylene interrupted with one or more N, O and/or S, optionally substituted cycloalkylene, optionally substituted cycloalkylenealkylene, optionally substituted cycloalkylenealkylenecycloalkylene, optionally substituted arylene, optionally substituted arylenealkylene, optionally substituted arylenealkylenearylene, optionally substituted heterocyclylene, optionally substituted heterocyclylenealkylene or optionally substituted heterocyclylenealkyleneheterocyclylene, each  $-Z_1-Z_2-$  are  $-NR_1-NR_1-$ ,  $t$  is 1 or 2, and  $k$  is as defined in claim 1.

**9. (currently amended)** A flame retardant composition according to claim 2, wherein the compound of formula (II) is selected from bis(cycloalkylazocycloalkyl)alkane, cycloalkylalkylazoalkane, arylalkylazoarylalkane, cycloalkylazoalkane, cycloalkylazocycloalkane, arylazoalkane and arylazoaryl compounds, ~~preferably from bis(cycloalkylazocycloalkyl)alkane, cycloalkylazoalkane or cycloalkylazocycloalkane~~ **[[.]]** whereby any of the alkyl-, aryl-, arylalkyl-, cycloalkyl- ~~and cycloalkylalkyl groups are~~ optionally substituted with 1-3 substituents.

**10. (original)** A flame retardant composition according to claim 1, wherein the compound of formula (I) is a compound of formula (IIb)



wherein one or both of ( $R_3$  and  $R_4$ ) and ( $R'_3$  and  $R'_4$ ) form together with said C-atom, wherein they are attached to, an optionally substituted, saturated, partially saturated or aromatic, mono- or polycyclic ring system as defined in claim 1, wherein said ring system is selected from phenyl, mono- or bicyclic cycloalkyl of 5-16 C-atoms or mono- or bicyclic heterocyclyl of 5-16 ring atoms with 1-4 N, O and/or S atoms; or each  $R_3$  and  $R_4$  and/or each  $R'_3$  and  $R'_4$  are independently H, alkyl, alkenyl, alkynyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl or heterocyclylalkyl, wherein the cycloalkyl and heterocyclyl as a group or part of a group is mono- or bicyclic ring with 5-16 ring atoms; and  $R_2$  is H or a bond in said ring system between said C-atom and a ring atom adjacent thereto;

or C-atom denotes together with H,  $R'_3$  and  $R'_4$ , which are attached thereto, a group  $-R'_5([Z_1-Z_2-R_6-]_kZ_1-Z_2-R_5-H)_t$  as defined claim 1, wherein each  $R'_5$  and  $R_5$  is independently alkyl, cycloalkylene, cycloalkylenealkylene, arylene, arylenealkylene, heterocyclylene, heterocyclylenealkylene, cycloalkylenealkylenecycloalkylene, arylenealkylenearylene or heterocyclylenealkyleneheterocyclylene; each  $R_6$  independently is alkylene, alkylene interrupted with one or more N, O and/or S, cycloalkylene, cycloalkylenealkylene, cycloalkylenealkylenecycloalkylene, arylene, arylenealkylene, arylenealkylenearylene, heterocyclylene, heterocyclylenealkylene or heterocyclylenealkyleneheterocyclylene, each  $-Z_1-Z_2-$  are  $-NR_1-NR_1-$ , t is 1 or 2, and k is as defined in claim 1; whereby

each group or a moiety of a group defined as variants for  $R_3$ ,  $R_4$ ,  $R'_3$ ,  $R'_4$ ,  $R'_5$ ,  $R_5$  and  $R_6$  optionally substituted independently with 1-3 of  $-OH$ ,  $-NH_2$ ,  $-COOH$ , alkyl, alkenyl, alkynyl, cycloalkyl,

cycloalkylalkyl, aryl, arylalkyl, alkyl-C(O)-O-, alkenyl-C(O)-O- and/or alkyl-O-C(O)-, whereby cycloalkyl and/or aryl moiety as or in said substituents is optionally substituted with alkenyl;

as well as an oxide(s) at the azo moiety, a salt, an ester or an amide thereof.

**11. (original)** A flame retardant composition according to claim 10, wherein the compound of formula (I) is a compound of formula (IIb')



wherein one or both of (R<sub>3</sub> and R<sub>4</sub>) and (R'<sub>3</sub> and R'<sub>4</sub>) form together with said C-atom, wherein they are attached to, a saturated, monocyclic ring system, wherein said ring system is selected from monocyclic cycloalkyl of 5-8 C-atoms; or each R'<sub>3</sub> and R'<sub>4</sub> are independently H, C<sub>1</sub>-C<sub>20</sub>alkyl or C<sub>5</sub>-C<sub>8</sub>cycloalkyl; and R<sub>2</sub> is H or a bond in said ring system between said C-atom and a ring atom adjacent thereto.

**12. (currently amended)** A flame retardant composition according to claim 1, which comprises as component (b) a compound of formula (IIc)



wherein R<sub>3</sub> and R<sub>4</sub> form together with said C-atom, wherein they are attached to, a cycloalkyl of 5-8 C-atoms;

and C-atom denotes together with H, R'<sub>3</sub> and R'<sub>4</sub>, which are attached thereto, a group

-R'<sub>5</sub>([Z<sub>1</sub>-Z<sub>2</sub>-R<sub>6</sub>]<sub>k</sub>Z<sub>1</sub>-Z<sub>2</sub>-R<sub>5</sub>-H)<sub>t</sub>, wherein each R'<sub>5</sub> and R<sub>5</sub> is independently C<sub>1</sub>-C<sub>8</sub>alkylene,

C<sub>5</sub>-C<sub>8</sub>cycloalkylene, C<sub>5</sub>-C<sub>8</sub>cycloalkylene-C<sub>1</sub>-C<sub>8</sub>alkylene[[.]] or

C<sub>5</sub>-C<sub>8</sub>cycloalkylene-C<sub>1</sub>-C<sub>8</sub>alkylene-C<sub>5</sub>-C<sub>8</sub>cycloalkylene;

each -Z<sub>1</sub>-Z<sub>2</sub>- is -N=N-, t is 1 and k is 0.

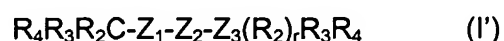
**13. (original)** A flame retardant composition according to claim 1, that comprises (c) a further flame retardant.

**14. (currently amended)** A flame retardant composition according to claim 13, wherein the further flame retardant is a halogenated flame retardant, a phosphorus compound, metal hydroxide, metal oxide[[s]], a melamine based flame retardant, N-hydrocarbyloxy substituted (NOR) hindered amine flame retardantFR, an aluminium compound, an antimony compound or a boron compound or mixture thereof.

**15. (original)** A flame retardant composition, which comprises

(a) a polymeric substrate, and

(b) a compound of formula (I')



wherein  $Z_1$  and  $Z_2$  are both  $NR_1$  and  $Z_3$  is C or N;  $r$  is 0, when  $Z_3$  is N, and  $r$  is 1, when  $Z_3$  is C;

the two  $R_1$ 's form together a bond or each  $R_1$  is independently H or forms a bond together with  $R_2$  present at the adjacent C-atom or, respectively,  $Z_3$ ;

each  $R_2$  independently forms a bond or is a monovalent radical as defined for  $R_3$  and  $R_4$  below;

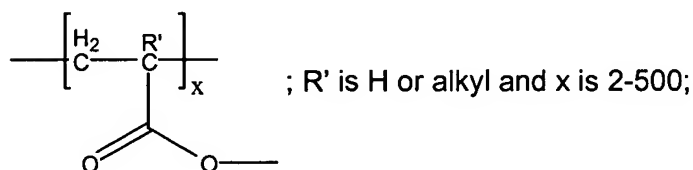
each  $R_3$  is independently and each  $R_4$  is independently a monovalent radical selected from H, optionally substituted alkyl, optionally substituted alkyl interrupted with one or more O, N and/or S atom(s), optionally substituted cycloalkyl, optionally substituted cycloalkylalkyl, optionally substituted aryl, optionally substituted arylalkyl, optionally substituted alkoxy(alkyl)<sub>n</sub>, optionally substituted aryloxy(alkyl)<sub>n</sub>, optionally substituted arylalkyloxy(alkyl)<sub>n</sub>, optionally substituted alkenyl, optionally substituted alkenyloxy(alkyl)<sub>n</sub>, optionally substituted alkynyl, optionally substituted alkynyloxy(alkyl)<sub>n</sub>, optionally substituted heterocyclyl(O)<sub>s</sub>(alkyl)<sub>n</sub> with one to four heteroatoms selected independently from N, O and S;  $R-Y-C(O)-(alkyl)_n$  or  $R-C(O)-Y-(alkyl)_n$ , wherein each R independently is H, alkyl, alkenyl, cycloalkyl, aryl or heterocyclyl as defined above, each of which is optionally substituted, Y is O or NH; each  $s$  and  $n$  is independently 0 or 1;

or at one or both of the C-atom and Z<sub>3</sub>, as given in the above formula (I), R<sub>3</sub> and R<sub>4</sub> form together with said C-atom or, respectively, Z<sub>3</sub>, wherein they are attached to, an optionally substituted, saturated, partially saturated or aromatic, mono- or polycyclic ring system of 5 to 20 carbon and, optionally, hetero ring atoms, whereby the optional hetero ring atoms are selected from N, O and/or S; and R<sub>2</sub> is a monovalent radical as defined for R<sub>3</sub> and R<sub>4</sub> above, or forms a bond between the C-atom and Z<sub>1</sub> or, respectively, between Z<sub>3</sub> and Z<sub>2</sub>, or forms a bond in the ring system formed by R<sub>3</sub> and R<sub>4</sub> between said C-atom or, respectively, Z<sub>3</sub>, and a ring atom adjacent thereto;

or Z<sub>3</sub> forms together with R<sub>2</sub>, if present, R<sub>3</sub> and R<sub>4</sub>, which are attached thereto, a group -R'<sub>5</sub>[(Z<sub>1</sub>-Z<sub>2</sub>-R<sub>6</sub>]<sub>k</sub>Z<sub>1</sub>-Z<sub>2</sub>-R<sub>5</sub>-H)<sub>t</sub>, wherein each R'<sub>5</sub> and R<sub>5</sub> is independently optionally substituted alkylene, optionally substituted alkylene interrupted with one or more N, O and/or S, optionally substituted cycloalkylene, optionally substituted cycloalkylenealkylene, optionally substituted cycloalkylenealkylenecycloalkylene, optionally substituted arylene, optionally substituted arylenealkylene, optionally substituted arylenealkylenearylene, optionally substituted heterocyclylene, optionally substituted heterocyclylenealkylene or optionally substituted heterocyclylenealkyleneheterocyclylene, each R<sub>6</sub> independently has a meaning as given for R'<sub>5</sub> and R<sub>5</sub> above, Z<sub>1</sub> and Z<sub>2</sub> are each independently as defined above, t is 1-3 and k is chosen so that the molecular weight of the resulting compound of formula (I) is within 200 to 10000 g/mol;

or Z<sub>3</sub> together with R<sub>2</sub>, if present, R<sub>3</sub> and R<sub>4</sub>, which are attached thereto, represent a linking group -R<sub>8</sub>- to form R<sub>2</sub>R<sub>3</sub>R<sub>4</sub>C-Z<sub>1</sub>-Z<sub>2</sub>-R<sub>8</sub>-[U]<sub>x</sub> which denotes a recurring structural unit of a polymer, wherein R<sub>8</sub> is a linking bond or alkylene, cycloalkylene, heterocyclylene or arylene;

U is a  $\left[ \text{CH}_2 - \underset{\text{|}}{\text{CR}} \right]_x$ , or



or the two R<sub>3</sub>'s, as given in the above formula (I), form together with the -(R<sub>2</sub>R<sub>4</sub>)C-Z<sub>1</sub>-Z<sub>2</sub>-Z<sub>3</sub>((R<sub>2</sub>)<sub>r</sub>R<sub>4</sub>)- moiety an optionally substituted, saturated, partially saturated or aromatic, mono- or polycyclic ring system of 5 to 20 carbon and, optionally, further hetero ring atoms, whereby the further hetero ring



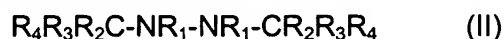
atoms are selected from one or two of N, O and/or S; and wherein  $Z_1$  to  $Z_3$ ,  $r$  and  $R_2$  to  $R_4$  are as defined above;

as well as an oxide of N as  $Z_1$ - $Z_3$ , a salt, an ester or an amide thereof, or a mixture of two or more compounds of formula (I') as defined above;

with the proviso that the composition does not contain any halogenated flame retardant compounds.

**16. (currently amended)** A flame retardant composition according to claim 15, wherein the compound of formula (I') is selected from the compounds of formulae (II)-(III):

a compound of formula (II)



wherein the two  $R_1$ 's form together a bond, or each  $R_1$  independently is H or forms a bond together with  $R_2$  present at the adjacent C-atom ~~as defined above~~;

a compound of formula (III)



wherein the two  $R_1$ 's form together a bond; and

wherein in the above formulae (II)-(III)  $R_1$  to  $R_4$  are defined in claim 15.

**17. (original)** A flame retardant composition according to claim 15, that comprises at least one further flame retardant (d) other than the compound of formula (I'),

with the proviso that the further flame retardant is other than a halogenated flame retardant compound.

**18. (currently amended)** A composition of claim 17, which comprises a synergistic mixture of the compound of formula (I') and one or more further flame retardants ~~FR~~ selected from **[[a ]]** non-

halogenated N-hydrocarbyloxy substituted (NOR) hindered amine flame retardants, aluminium compounds, boron compounds, magnesium hydroxide and/or intumescent systems.

**19. (currently amended)** A composition according to claim 1~~[[.]]~~ ~~13, 15 or 17~~ comprising at least one further additive.

**20. (currently amended)** A composition according to claim 19, comprising as further additives phenolic and/or aminic antioxidants, hindered amine light stabilizers, UV-absorbers, phosphites, phosphonites, benzofuranones, metal stearates, metal oxides, pigments, dyes, organophosphorus compounds, hydroxylamines or flame retardants or mixtures thereof.

**21-28. (canceled)**